

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) An imaging arrangement for imaging an optical code or target at a plurality of focal planes comprising:

an image sensor having first and second one-dimensional image sensor arrays, the first and second image sensor arrays each have one row of pixels for obtaining a respective row of pixel data corresponding to an image focused thereon; and

a lens assembly having at least one objective lens, said at least one objective lens being positioned along a single optical axis of the imaging arrangement for focusing an image of the optical code or target at a substantially central longitudinal axis of the image sensor such that during an imaging operation, portions of the image are focused on the first and second image sensor arrays for obtaining two rows of pixel data, each row of pixel data corresponding to at least a portion of the optical code or target, wherein the lens assembly includes a plurality of optical elements for further focusing the image on at least one of the first and second one-dimensional image sensor arrays, and wherein the plurality of optical elements overlay at least a portion of at least one of the first and second one-dimensional image sensor arrays.

2. (Original) The imaging arrangement according to Claim 1, wherein the optical code or target is selected from the group consisting of a barcode symbol, a label, a marking, and a picture.

3. (Original) The imaging arrangement according to Claim 2, wherein the barcode symbol is one of a one-dimensional and a two-dimensional barcode symbol.

4. (Original) The imaging arrangement according to Claim 1, wherein the imaging arrangement has a working range in the range of approximately 5cm to 102cm.

5. (Previously Presented) The imaging arrangement according to Claim 1, wherein the lens assembly is stationary.

6. (Cancelled)

7. (Currently Amended) The imaging arrangement according to Claim [[6]] 1, wherein the plurality of optical elements are selected from the group consisting of glass, lens, holographic optical elements, plastic, and other transparent materials.

8. (Cancelled)

9. (Currently Amended) The imaging arrangement according to Claim 7, wherein the plurality of optical elements overlay the entire row of pixels of [[of]] the at least one one-dimensional image sensor array.

Claims 10-12. (Cancelled)

13. (Currently Amended) An imaging arrangement for imaging an optical code or target at a plurality of focal planes comprising:

an image sensor having a one-dimensional image sensor array, the one-dimensional image sensor array having a row of pixels for obtaining a row of pixel data corresponding to an image focused thereon; and

a lens assembly having at least one objective lens, said at least one objective lens being positioned along a single optical axis of the imaging arrangement for focusing an image of the optical code or target at a substantially central longitudinal axis of the image sensor such that during an imaging operation, portions of the image are focused on the one-dimensional image sensor array for obtaining a row of pixel data corresponding to at least a portion of the optical code or target; and

a plurality of optical elements overlaying at least a portion of the one-dimensional image sensor array.

14. (Original) The imaging arrangement according to Claim 13, wherein the imaging arrangement has a working range in the range of approximately 5cm to 102cm.

15. (Currently Amended) The imaging arrangement according to Claim 13, further comprising ~~an actuator operatively coupled to a carrier housing the at least one objective lens for moving the carrier along the optical axis.~~

16. (Previously Presented) An imaging arrangement for imaging an optical code or target at a plurality of focal planes comprising:

a one-dimensional image sensor array having at least one row of pixels for obtaining a row of pixel data corresponding to an image focused thereon; and

a lens assembly having at least one objective lens, the at least one objective lens being positioned along an optical axis of the imaging arrangement, and a carrier having a plurality of optical elements configured for positioning at least one of the plurality of optical elements along the optical axis for focusing an image of the optical code or target on the one-dimensional image

sensor array for obtaining a row of pixel data corresponding to at least a portion of the optical code or target.

17. (Original) The imaging arrangement according to Claim 16, wherein the imaging arrangement has a working range in the range of approximately 5cm to 102cm.

Claim 18. (Cancelled)

19. (Previously Presented) The imaging arrangement according to Claim 16, wherein the plurality of optical elements are selected from the group consisting of glass, lens, holographic optical elements, plastic, and other transparent materials.

20. (Previously Presented) The imaging arrangement according to Claim 15, wherein the carrier is moved in the range of 0-100 μ m by the actuator.

21. (Cancelled)

22. (Currently Amended) The imaging arrangement according to Claim [[21]] 24, wherein the imaging arrangement has a working range in the range of approximately 5cm to 102cm.

23. (Currently Amended) The imaging arrangement according to Claim [[21]] 24, wherein the plurality of optical elements are selected from the group consisting of glass, lens, holographic optical elements, plastic, and other transparent materials.

24. (Currently Amended) An imaging arrangement for imaging an optical code or target at a plurality of focal planes comprising:

a one-dimensional image sensor array having one row of pixels for obtaining one row of pixel data corresponding to an image focused thereon; and

a lens assembly having at least one objective lens positioned along an optical axis of the imaging arrangement for focusing an image of the optical code or target on the one-dimensional image sensor array for obtaining a row of pixel data corresponding to at least a portion of the optical code or target, wherein a plane of the optical code or target is correlated in space to at least one of the plurality of focal planes;

an actuator operatively coupled to a carrier housing the at least one objective lens for moving the at least one objective lens along the optical axis; and ~~The imaging arrangement according to Claim 21, further comprising:~~

a motor operatively coupled to another carrier having the plurality of optical elements, wherein the actuator and motor can be operated simultaneously and non-simultaneously for moving the carriers simultaneously and non-simultaneously, respectively, for focusing the image on the one-dimensional image sensor array.

25. (Cancelled)

26. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the optical code or target is selected from the group consisting of a barcode symbol, a label, a marking, and a picture.

27. (Original) The barcode imager according to Claim 26, wherein the barcode symbol is one of a one-dimensional and a two-dimensional barcode symbol.

28. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the imaging arrangement has a working range in the range of approximately 5cm to 102cm.

29. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the imaging arrangement further comprises an actuator operatively coupled to a carrier housing the at least one objective lens for moving the carrier along the optical axis.

30. (Original) The barcode imager according to Claim 29, wherein the carrier is moved in the range of 0-100 μ m by the actuator.

31. (Cancelled)

32. (Currently Amended) The barcode imager according to Claim [[31]] 34, wherein the plurality of optical elements are selected from the group consisting of glass, lens, holographic optical elements, plastic, and other transparent materials.

33. (Cancelled)

34. (Currently Amended) A barcode imager for imaging an optical code or target at a plurality of focal planes comprising:

means for initiating an imaging operation for imaging the optical code or target at at least one of the plurality of focal planes;

an imaging arrangement comprising:

a one-dimensional image sensor array having a row of pixels for obtaining a row of pixel data corresponding to an image of the optical code or target during the imaging operation; and

a lens assembly having at least one objective lens, said at least one objective lens being positioned along a single optical axis of the imaging arrangement for focusing the image at a substantially central longitudinal axis of the image sensor array, wherein the lens assembly

includes a plurality of optical elements for further focusing the image on the at least one one-dimensional image sensor array; and

~~The barcode imager according to Claim 31, wherein the imaging arrangement further comprises a carrier having a plurality of segments, wherein each of the plurality of optical elements is provided at a corresponding one of the plurality of segments.~~

35. (Original) The barcode imager according to Claim 34, wherein one of the plurality of segments is an open segment and does not include an optical element, and wherein the imaging arrangement further comprises a motor operatively coupled to the carrier for positioning the open segment or one of the plurality of optical elements along the optical axis.

36. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the imaging arrangement further comprises:

an actuator operatively coupled to ~~a first~~ another carrier housing the at least one objective lens for moving the first carrier along the optical axis; and

a motor operatively coupled to ~~a second~~ the carrier having [[a]] the plurality of optical elements, wherein the actuator and motor can be operated simultaneously and non-simultaneously for moving the ~~first carrier and the second carriers~~ simultaneously and non-simultaneously, respectively, for further focusing the image on the ~~at least one~~ one-dimensional image sensor array.

37. (Currently Amended) The barcode imager according to Claim [[25]] 34, further comprising:

a memory for storing rows of pixel data corresponding to different portions of the optical code or target; and

a processor for processing the stored rows of pixel data.

38. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the at least one of the plurality of focal planes is an optimal focal plane.

39. (Currently Amended) The barcode imager according to Claim [[25]] 34, wherein the at least one of the plurality of focal planes is at least one focal plane proximally or distally located from an optimal focal plane.

40. (Currently Amended) The barcode imager according to Claim [[25]] 34, further comprising means for focusing different sets of the plurality of focal planes on the one-dimensional imager sensor ~~arrays~~ array.

41. (Currently Amended) The barcode imager according to Claim 40, wherein the means for focusing different sets of the plurality of focal planes includes an actuator operatively coupled to another carrier housing the at least one objective lens for moving [[the]] this carrier along the optical axis.

42. (Currently Amended) The barcode imager according to Claim 40, wherein the means for focusing different sets of the plurality of focal planes includes a motor operatively coupled to [[a]] the carrier having [[a]] the plurality of optical elements, and wherein said motor is capable of positioning each of the plurality of optical elements along the optical axis.

43. (Currently Amended) A method for imaging an optical code or target at a plurality of focal planes using an imaging arrangement, said method comprising the steps of:

initiating an imaging operation for imaging the optical code or target at at least one of the plurality of focal planes onto an image sensor having first and second one-dimensional image sensor arrays via at least one objective lens positioned along a single optical axis of the imaging arrangement; and

obtaining two rows of pixel data, each row of pixel data corresponding to the optical code or target during the imaging operation; and

positioning at least one optical element between the at least one objective lens and the at least one one-dimensional image sensor array, wherein the at least one optical element overlays at least a portion of at least one of the one-dimensional image sensor arrays.

44. (Original) The method according to Claim 43, further comprising the steps of:
determining whether at least one row of pixel data can be decoded and/or processed; and
decoding and/or processing a row of pixel data if it is determined that at least one row of pixel data can be decoded and/or processed.

45. (Original) The method according to Claim 44, further comprising the steps of:
moving the at least one objective lens if it is determined that at least one row of pixel data cannot be decoded and/or processed; and
repeating the initiating, obtaining and determining steps, and one of the decoding and moving steps, until the at least one row of pixel data is decoded and/or processed.

46. (Original) The method according to Claim 43, further comprising the steps of:
moving the at least one objective lens;
repeating the initiating, obtaining and moving steps, until the at least one objective lens has been moved through every position; and
decoding and/or processing at least one row of obtained pixel data.

47. (Original) The method according to Claim 43, further comprising the steps of:
storing the row of pixel data;
repeating the initiating and storing steps until a plurality of rows of pixel data
corresponding to the optical code or target are stored; and
decoding and/or processing the plurality of stored rows of pixel data.

48. (Original) The method according to Claim 43, wherein the optical code or target
is selected from the group consisting of a barcode symbol, a label, a marking, and a picture.

49. (Original) The method according to Claim 48, wherein the barcode symbol is one
of a one-dimensional and a two-dimensional barcode symbol.

50. (Cancelled)

51. (Currently Amended) The method according to Claim [[50]] 43, wherein the at
least one optical element is selected from the group consisting of glass, lens, holographic optical
elements, plastic, and other transparent materials.

52. (Cancelled)

53. (New) An imaging arrangement for imaging an optical code or target at a
plurality of focal planes comprising:

at least one one-dimensional image sensor array each having at least one row of pixels for
obtaining at least one row of pixel data corresponding to an image focused thereon;

a lens assembly having at least one objective lens positioned along an optical axis of the
imaging arrangement for focusing an image of the optical code or target on the at least one one-
dimensional image sensor array for obtaining one of a row or two rows of pixel data
corresponding to at least a portion of the optical code or target, wherein a plane of the optical

code or target is correlated in space to at least one of the plurality of focal planes, wherein the lens assembly includes a plurality of optical elements for further focusing the image on the at least one one-dimensional image sensor array; and

a carrier having a plurality of segments, wherein each of the plurality of optical elements is provided at a corresponding one of the plurality of segments.

54. (New) The imaging arrangement according to Claim 53, wherein one of the plurality of segments is an open segment and does not include an optical element, and further comprising a motor operatively coupled to the carrier for positioning the open segment or one of the plurality of optical elements along the optical axis.

55. (New) The imaging arrangement according to Claim 53, further comprising:
an actuator operatively coupled to a first carrier housing the at least one objective lens for moving the first carrier along the optical axis; and
a motor operatively coupled to a second carrier having a plurality of optical elements, wherein the actuator and motor can be operated simultaneously and non-simultaneously for moving the first carrier and the second carrier simultaneously and non-simultaneously, respectively, for further focusing the image on the at least one one-dimensional image sensor array.

56. (New) A barcode imager for imaging an optical code or target at a plurality of focal planes comprising:

means for initiating an imaging operation for imaging the optical code or target at at least one of the plurality of focal planes;

an imaging arrangement comprising:

an image sensor having at least one one-dimensional image sensor array having a row of pixels for obtaining pixel data corresponding to an image of the optical code or target during the imaging operation; and

a lens assembly having at least one objective lens, said at least one objective lens being positioned along a single optical axis of the imaging arrangement for focusing the image a substantially central longitudinal axis of the image sensor such that, during the imaging operation for obtaining pixel data, a row of pixel data corresponds to at least a portion of the optical code or target; and

means for focusing different sets of the plurality of focal planes on the at least one one-dimensional imager sensor array, wherein the means for focusing different sets of the plurality of focal planes includes a motor operatively coupled to a carrier having a plurality of optical elements, and wherein said motor is capable of positioning each of the plurality of optical elements along the optical axis.

57. (New) The barcode imager according to Claim 53, wherein the means for focusing different sets of the plurality of focal planes includes an actuator operatively coupled to a carrier housing the at least one objective lens for moving the carrier along the optical axis.

58. (New) A barcode imager for imaging an optical code or target at a plurality of focal planes comprising:

means for initiating an imaging operation for imaging the optical code or target at at least one of the plurality of focal planes; and

an imaging arrangement comprising:

an image sensor having first and second one-dimensional image sensor arrays, the first and second image sensor arrays each have a row of pixels for obtaining a respective row of pixel data corresponding to an image of the optical code or target during the imaging operation;

a lens assembly having at least one objective lens, said at least one objective lens being positioned along a single optical axis of the imaging arrangement for focusing the image at a substantially central longitudinal axis of the image sensor such that during the imaging operation for obtaining two rows of pixel data each row of pixel data corresponds to at least a portion of the optical code or target;

an actuator operatively coupled to a first carrier housing the at least one objective lens for moving the first carrier along the optical axis; and

a motor operatively coupled to a second carrier having a plurality of optical elements, wherein the actuator and motor can be operated simultaneously and non-simultaneously for moving the first carrier and the second carrier simultaneously and non-simultaneously, respectively, for further focusing the image on the at least one one-dimensional image sensor array.